

Association of Allelic Polymorphisms of the Wx and SSIIa Genes with Amylose Content in Rice (*Oryza sativa* L.) Collection Accessions

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Abstract:

The aim of this study was to assess the genetic diversity of rice collection accessions for amylose content and identify the relationship between this trait and polymorphisms in starch biosynthesis genes. The study included 154 accessions from the IPBB rice collection. The amylose content was determined quantitatively, and genotyping was performed using functional markers of the Wx genes (Glu-23, Ex_6A/C, Ex_10C/T) and SSIIa. The analysis showed significant variability in amylose content – from 0 to 35.9% with an average value of 15.1%. The dominant allele Wx was detected in 137 samples, while the recessive allele wx was detected in 17 samples. At the Ex_6A/C locus, carriers of the A allele were characterized by a higher amylose content (16.5%) compared to carriers of the C allele (8.2%). At the Ex_10C/T locus, samples with the T allele had an increased amylose content (24.4%) relative to samples carrying the C allele (14.9%). The TT genotype of the SSIIa locus was also associated with higher amylose content (16.4%) compared to the GC genotype (14.1%). These results confirm the important role of the Wx and SSIIa genes in determining amylose content and demonstrate the potential of using functional markers in marker-assisted breeding of rice.